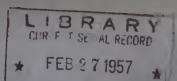
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FEDERAL - STATE COOPERATIVE OF AGRICULTURE
SNOW SURVEYS and

WATER SUPPLY FORECASTS



## Colorado, Rio Grande, Platte, and Arkansas Drainage Basins

UNITED STATES DEPARTMENT of AGRICULTURE...SOIL CONSERVATION SERVICE.
and

COLORADO AGRICULTURAL EXPERIMENT STATION and STATE ENGINEER of NEW MEXICO

Data included in this report were obtained by the agencies named above in cooperation with the U.S. Forest Service, National Park Service, Bureau of Reclamation, State Engineers of Colorado and Wyoming; and other Federal, State and local organizations.

FEB. 1, 1957

## UNITED STATES DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE

TO RECIPIENTS OF COOPERATIVE SNOW SURVEY AND WATER SUPPLY FORECAST REPORTS:

Snow surveys in the West are conducted each year at more than 1200 snow courses. Basin and Province or State snow survey reports summarizing the results of the measurements and forecasts of seasonal runoff and water supply are issued by the soil Conservation Service, U. S. Department of Agriculture and some of its cooperators; the Water Rights Branch of the British Columbia Department of Lands and Forests; and the California Division of Water Resources.

Copies of the various federal-state cooperative snow survey reports listed below may be secured by writing to:

Head, Water Supply Forecasting Section Soil Conservation Service 209 S. W. 5th Avenue Portland 4, Oregon

R A	MIZA	REF	OR	TS.

Colorado, Rio Grande...Issued monthly February through May by SCS and and Platte-Arkansas Colorado Experiment Station, Fort Collins, Colorado.\*

River Basins

Columbia River......Issued monthly January through May by Soil Conserva-Basin tion Service, Boise, Idaho.\*

Upper Missouri....... Issued monthly February through May by SCS and
River Basin Montana Agricultural Experiment Station, Bozeman,
Montana.\*

West-Wide Water......Issued April 1 by Soil Conservation Service and Supply Outlook Cooperators, Portland, Oregon.

#### STATE REPORTS:

Arizona...... Issued semi-monthly January 15 through April 1 by SCS and Salt River Valley Water Users Association, Phoenix, Arizona.\*

Nevada................. Issued monthly February through April by SCS and Nevada State Engineer, Reno, Nevada.\*

Oregon. ........... Issued monthly January through May by SCS, Portland, Oregon, and Oregon Agricultural Experiment Station.\*

Utah...... Issued monthly January through May by SCS, Salt Lake
City, Utah, and State Engineer of Utah and Utah Agricultural Experiment Station.\*

Washington..... Issued monthly February through May by SCS, Spokane,
Washington, and State Department of Conservation and
Development.\*

Wyoming..... Issued monthly February through May by SCS, Casper, Wyoming, and State Engineer of Wyoming.\*

\*Special reports are issued as needed.

The British Columbia reports are issued February 1 through June 1 and may be secured from Comptroller, Water Rights Branch, Department of Lands and Forests, Parliament Buildings, Victoria, B. C.

The California reports are issued monthly February 1 through May 1 and may be secured from Division of Water Resources, California Department of Public Works, Sacramento, California.

The annual water supply forecasts of the Weather Bureau are available in monthly bulletins published from January through May. These bulletins entitled, "Water Supply Forecasts for the Western United States" may be obtained from River Forecast Center, Weather Bureau, 712 Federal Office Building, Kansas City 6, Missouri.

### FEDERAL-STATE COOPERATIVE

#### SNOW SURVEYS AND WATER SUPPLY FORECASTS

for

COLORADO RIVER, PLATTE RIVER ARKANSAS RIVER AND RIO GRANDE DRAINAGE BASINS

Issued

February 8, 1957

Report Prepared By
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United States Department of Agriculture
Soil Conservation Service
and
Colorado Agricultural Experiment Station
Fort Collins, Colorado
and
State Engineer of Colorado
Denver, Colorado
and
State Engineer of New Mexico
Santa Fe, New Mexico

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S. E. Reynolds State Engineer State of New Mexico

General Series Paper No. 651 Colorado Agricultural Experiment Station

Snow Survey measurements in Wyoming, Utah, and Arizona are supplied by Snow Survey Supervisors in those states.

# WATER SUPPLY OUTLOOK COLORADO, PLATTE, ARKANSAS, RIO GRANDE DRAINAGE BASINS FEBRUARY 1, 1957

WATER SUPPLY OUTLOOK FOR COLORADO AND NEW MEXICO AS OF FEBRUARY 1, 1957 IMPROVED OVER THE PAST FOUR YEARS IN MOST AREAS. EARLY SEASON SNOW PACK IS WELL ABOVE AVERAGE EXCEPT FOR NORTHERN TRIBUTARIES OF SOUTH PLATTE AND THE LARAMIE RIVER IN NORTHERN COLORADO AND ON DOLORES RIVER IN THE SOUTHWEST. IF SNOW FALL IS NORMAL FOR THE REMAINDER OF THE SEASON, CONTINUED WATER SHORTAGE MAY STILL BE EXPECTED ON THE LOWER SOUTH PLATTE, THE ARKANSAS, THE DOLORES, AND ALONG THE RIO GRANDE IN NEW MEXICO. SHORTAGES SHOULD NOT BE AS SEVERE AS IN 1956.

SEASONAL SNOW FALL IN ARIZONA HAS BEEN BELOW NORMAL, RESERVOIR STORAGE IS LOW. SURFACE WATER SUPPLY OUTLOOK IS EXTREMELY POOR FOR ALL IRRIGATED AREAS.

The water supply outlook for Colorado and New Mexico is much improved generally over that of the 1956 season. January snow fall in both states was unusually heavy. Seasonal totals on February 1 ranged from near normal on the Poudre, Thompson and Saint Vrain tributaries to the South Platte to nearly twice normal on some areas of the Colorado section of the Rio Grande drainage. Seasonal runoff should not be expected to be in line with the present percentages of normal snow pack. Only one-half of the snow season is past. Most important in the current outlook is dry mountain soils, low water tables and a series of drouth years which has reduced the summer flow to be expected from any given snow pack. With average snow fall for the rest of the season and normal conditions during the runoff season it is doubtful if the flow of any stream except the Yampa, White, Gunnison and San Juan will exceed normal during the next season. Shortages may be expected on the lower Platte and Arkansas but the shortage will not be as severe as in 1956.

SOUTH PLATTE. Water supplies for irrigated areas near the mountains should be reasonably adequate for areas with the supplemental supply from the Colorado-Big Thompson Project. Some continued shortage should be expected along the Upper South Platte, Clear Creek and South Boulder. The water shortage along the Platte from Kersey to Julesburg will most likely be similar to that which existed in 1956. Surface soil moisture conditions are fair to good. Reservoir storage is below normal.

ARKANSAS. The snow pack to date on the Arkansas River and its southern tributaries is well above average but due to other conditions affecting the flow during 1957, less than normal runoff must be expected. Unless summer rainfall is well above average, shortages will be more severe for downstream areas than near the mountains. Reservoir storage is again practically non-existent. Soils in irrigated areas are dry. A much heavier snow pack along with adequate summer rainfall will be necessary to alleviate drouth conditions in the Arkansas Valley.

RIO GRANDE. The snow pack along both the Continental Divide and the Sangre de Cristo mountains ranges from 125 to 200 percent of normal for February 1. Snow pack on most courses exceeds the maximum for 1956, but are well below those on February 1, 1952. The outlook for the Rio Grande in San Luis Valley and through New Mexico is much better than in any year since 1952. Above normal mountain snow fall and valley precipitation has extended further into Northern New Mexico than has been the situation in recent years. However, due to dry soils and depletion of groundwater, the summer flow of the Rio Grande will probably not exceed normal into San Luis Valley and be materially less than normal through New Mexico. As has happened for several years, a large amount of snow melt will be used to replace soil moisture and groundwater deficits. Reservoir storage in San Luis Valley is a small fraction of normal. El Vado is practically empty. Elephant Butte and Caballo reservoirs contain only about 10 percent of the average carryover for February 1. The water supply outlook for the Carlsbad and Tucumcari projects are poor principally due to lack of reservoir storage and drouth in the irrigated area.

COLORADO RIVER. If snow fall during the later winter and spring months is normal or above, water supply should be adequate in Western Colorado except for the irrigated area served by the Dolores River. Since snow fall has extended to lower elevations, water supply for small irrigated areas along tributary streams should be better than for the past four years. However, total summer flow of the Colorado River and its tributaries will probably not exceed average except for possibly the Gunnison and the main stem of the San Juan. All streamflow except the Yampa and White watersheds will probably exceed that of the season of 1956. Snow pack of February 1 is near one and one-half times normal for this date except for the extreme southwestern part of the State. As with other watersheds, the estimate of summer runoff is reduced because of dry mountain soils and the series of years of drouth which tends to reduce the flow to be expected from a given snow pack. Reservoir storage in Colorado River tributaries is generally less than normal and a year ago.

NORTH PLATTE. The snow pack to date is well above normal on the North Platte. Storage in the four major reservoirs in Wyoming is down slightly from a year ago and about 75 percent of average. With the heavy snow fall during January, inflow to Seminoe Reservoir should be near average during 1957. The water supply outlook for areas along the North Platte in Eastern Wyoming, Western Nebraska is not quite as favorable as in 1956 due to lack of reservoir storage for the older North Platte Project. The snow pack in the Laramie River is only slightly above average. Streamflow in 1957 will probably be near three-quarters of normal which indicates another year of shortage for the Wheatland area.

UTAH. The water supply outlook for Colorado River tributaries in Utah is relatively poor as of February 1. The snow pack is below normal and mountain soils are extremely dry. Unless snow pack is well above normal for the remainder of the season, shortage of irrigation water will occur.

ARIZONA. Snow in the mountains of Arizona is generally below normal. There were some good rains during January and fair winter runoff has occurred in the Tonto and Verde Rivers. Overall, the water supply outlook continues to be extremely poor. Storage on the Salt River and its tributaries is now a little over 400,000 acre-feet as compared to nearly 700,000 on February 1, 1956 and 750,000 as an average for the past 15 years. San Carlos Reservoir on the Gila River stores only 7,000 acre-feet as compared to 75,000 a year ago.

Colorado River runoff into Lake Mead is expected to be slightly less than normal but more than for 1956 during the snow melt season.

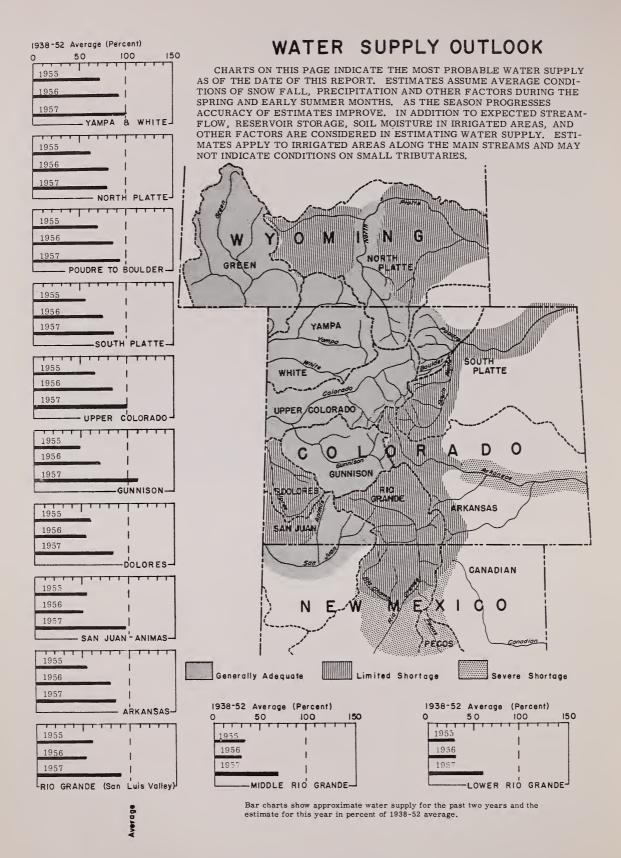


Wayne A. Smith, Littleton and Jack N. Washichek, Ft. Collins, checking snow on Berthoud Pass

## COOPERATIVE SNOW SURVEYS

## SUMMARY OF SNOW MEASUREMENTS February 1, 1957

WATERSHEDS	No. of Courses	Years of	Water (		WAMEDOUEDC	No. of	Years of	Water C	
WATERSHEDS	Averaged		as perc 1956	Avg.	WATERSHEDS	Courses Averaged		1956	Avg.
ARKANSAS RIVER					PLATTE RIVER				
Arkansas River	6.	16-21	117	155	Sweetwater	2	15	53	90
111 -1411343 211101	_				North Platte River	11	7-21	99	136
COLORADO RIVER				1	Laramie River	8	8-20	88	122
Colorado River*	16	8-21	77	111	South Platte River**		8-18	113	134
Roaring Fork	3	11-21	114	157	Poudre River	6	8-18	78	114
Plateau Creek	2	12-20	116	150	Big Thompson River	3	8-18	66	90
Yampa River	4	16-21	98	144	St. Vrain River	2	8-19	87	91
White River	2	17-21	113	150	Boulder Creek	1	18	99	130
Gunnison River	7	13-21	120	155	Clear Creek	3	8-17	69	109
Dolores River	2	17-18	97	122	01001	4			
Green River (Wyo.)					RIO GRANDE				
San Juan River	5	15-17	131	173	Rio Grande (Colo.)	4	8-18	131	163
Animas River	2	18-20	106	172	Rio Grande (N. M.)	9	9-19	171	135
Gila River	9	9-19	110	90	Conejos River	2	16-18	129	157
Salt River	5	16-19	74	81	Chama River	4	15-18	133	153
Verde River	4	10-11	380	68	Pecos River	2	15-18	141	83
Little Colo. River	4	10-19	98	86	Canadian River	3	5-18	190	130
Williams River	2	11		307	Alamosa River	2	12-17	161	159
Lower Colo. River	3	9-10	179	109					
*Above Glenwood Spr	rings				**Above Denver				



#### WATER SUPPLY OUTLOOK

The bar charts on the opposite page represent graphically the most probably water supply outlook for 1957 as compared to the past two years 1955 and 1956. Streamflow and other factors for 1956 have been partially estimated because full data on water supply conditions are not yet available. Estimates of past conditions and forecasts have been made by the authors of this report. For details on water supply conditions on the Colorado River drainage not shown on this map, reference should be made to State snow reports for Utah and Arizona (See Inside Cover).

YAMPA AND WHITE. The water supply on these streams should be adequate for most needs during the 1957 season. Streamflow should be similar to that for 1956.

NORTH PLATTE. Streamflow during 1957 in Colorado and Wyoming should be near average and meet all requirements above Seminoe Reservoir. Because of lack of reservoir storage, water shortages may be expected for some irrigated areas of eastern Wyoming and Western Nebraska. Of the nearly one-half million acre-feet in storage in Wyoming, only about 75,000 acre-feet are available for the older. North Platte project. Should snow fall for the remainder of the season and precipitation next summer be deficient the water shortage could be severe. The most probable outlook at this time is considered as fair. Water supply will not be adequate in the Wheatland area served by the Laramie River.

POUDRE TO BOULDER. Natural streamflow in these South Platte tributaries will be less than normal based on present snow accumulation. The chart bar includes water available from the Colorado-Big Thompson project. With this supplemental supply irrigation water should be reasonably adequate, but not plentiful. Opportunities to replenish the depleted reservoir storage will again be limited unless there are good rains over the entire South Platte Watershed during the peak of snow-melt.

UPPER SOUTH PLATTE--CLEAR CREEK. The seasonal snow pack to date is near normal and somewhat less than a year ago. Snow fall after February 1, in 1956, was much below average. Assuming normal snow fall for the remainder of the season, runoff for 1957 should slightly exceed that for 1956. Storage in municipal reservoirs for the City of Denver is 120 percent of that of a year ago and 45 percent of normal.

Water supply on the lower South Platte, particularly between Kersey and Brush will again be short in 1957 unless the relative snow pack improves substantially before the runoff starts.

UPPER COLORADO. The flow of the Upper Colorado River and its tributaries in 1957 will be similar to that for 1956. Inflow to Granby will most probably be about the same as for last year but the indicated inflow to Green Mountain on the Blue River is somewhat less. Low elevation snow on the watershed is much above average which shouldwet the soils on irrigated lands. This condition improves the outlook for the irrigated areas along the smaller tributary streams. Water supplies that come directly from the main streams should be adequate.

GUNNISON. The snow pack to date on the Gunnison River Watershed ranges from 150 to nearly 200 percent of normal for this date. Water supplies will be adequate along the main stream with possibly some shortage on the tributaries to the North Fork. The outlook is much better than for 1956. This high snow pack is 25 to 35 percent less than that on February 1, 1952, the most recent heavy runoff year. Taylor Park Reservoir contains 20,000 acre-feet or about one-third of normal. It should fill during the spring melt.

DOLORES. The water supply outlook for the Dolores River is the poorest in Western Colorado. Snow pack is near normal for this date of early season but due to dry soils runoff will be deficient. The flow of the Dolores at Dolores probably will slightly exceed that for 1956. Similar conditions exist on the LaPlata. Soil moisture conditions in the irrigated area will be good after melting of the present snow cover.

SAN JUAN-ANIMAS. The summer flow of the San Juan should be near normal if average snowfall occurs from now through the snow-melt season. The flow of the Animas, Pine and Piedra Rivers will be slightly less. Water supply, except for the smaller tributaries, should be adequate in 1957.

ARKANSAS. Snow cover on the mountains of the Upper Arkansas is above normal for this date. It is particularly heavy at Monarch Pass and along the Sangre de Cristo mountains into New Mexico. Although streamflow will probably be better than in 1956, it will probably not exceed the 1938-52 average. Unless substantial rains occur during the summer months, it is expected that the flow of the Arkansas River below Pueblo will be substantially less than average. In view of dry soils in irrigated areas and lack of water in storage, water shortage is again expected. It should not be as severe as in 1956.

RIO GRANDE (San Luis Valley). The flow of the Rio Grande and its tributaries, both east and west of the river, is expected to be near normal for 1957. The snow pack ranges from 125 percent of to nearly twice normal especially at high elevations for February 1. This snow pack materially exceeds that for the past four years on most dates but is approximately one-fourth less than that on February 1, 1952. The outlook is definitely the best for the past four years on this date even if a lot of snow melt will be used to replace deficits of soil moisture and groundwater.

MIDDLE RIO GRANDE (New Mexico). Snow pack in northern New Mexico is 150 percent of normal but well below that for this date in 1952. Soil moisture in this area is somewhat better than for a year ago. However, due to a long period of drouth and lack of reservoir storage, and other factors, the flow of the Rio Grande at Otowi Bridge will probably not exceed three-quarters of the 1938-52 average for flow for the summer period.

LOWER RIO GRANDE. Inflow to Elephant Butte will exceed that for any of the past four years, but total inflow and stormage will probably not provide half of the historical water use along the river in Southern New Mexico and West Texas. Unless there is unusually heavy precipitation in lage spring the flow of the river will drop in percent of normal along its course.

## SNOW COURSE MEASUREMENTS

February 1, 1957

SNOW COURSE	Snow Depth 1957 In Inches		er Conten Inches 1956		Years of Record	SNOW COURSE	Snow Depth 1957 In Inches		r Content Inches 1956		Years of Record
	LATTE RIV	ER DR			**	1	PLATTE RIV	ER DR	AINAGE		**
SWEETWATER RIV	ER					CLEAR CREEK					
Grannier Meadows	38	8.4	15.6	9.7	15	Loveland Pass	46	9.6	14.5	8.3	17
South Pass*	36	9.0	17.0	9.7	15	Grizzly Peak*	48	11.3	17.7	11.3	
Larsen Creek			11.2		1	Empire	27	5.9	6.6	5.1	
						Berthoud Falls	43.	10.6	11.5		. 6
NO. PLATTE RIVE			40.0			Clear Creek	49	11.5	14.5		5
Cameron Pass(a) Es		12.8	18.0	12.5		SOUTH PLATTE	neren				
Park View	36 70	7.8 18.1	6.5 21.1	14.3		Hoosier Pass	KIVER 41	11.0	9.6	6.6	18
Columbine Lodge Willow Cr. Pass*	44	10.1	10.0	7.6	. –	Jefferson Cr.	36	7.4	7.3	4.9	
Northgate	30	5.8	5.0	4.4		Geneva Park	8	3.9	2.9	4.8	
Bottle Creek	47	13.4	11.8	8. 2		deneva rara	_		-•-		
Webber Spring	57	16.5	15.4	10.8		Al	RKANSAS RIV	ER DR	AINAGE		
Old Battle	87	26.6	25.0	19.2	19						
N. French Creek	78	24.1	23.1	16.7	19	ARKANSAS RIVER	}				
N. Barrett Creek	53	15.4	15.5	11.5	19	Tennessee Pass	43	8.4	9.6	5.6	
Ryan Park	42	10.0	10.2	6.8	_	Twin Lakes T.	28	6.8	6.9	6.9	
Spring Creek	45	13.0				La Veta Pass*	48	12.4	8.5	5.6	17
Albany	43	10.9	12.0	11.1		4 Mile Park	31	5.7	3, 3	2.9	17
LaBonte			3.3	4.7		Fremont Pass	50	11.6	14.6	9.6	
Boxelder			2.8		6	Blue Lakes	NS	NS	NS		
						Monarch Pass	66	17.7	11.6	10.5	16 7
LARAMIE RIVER			14.0	10.5	15	Saint Elmo (a)	50	11.2	8.8 17.4	10.1	6
Roach (a) Est		10.7 9.5	14.0 14.0	10.7 7.3	15 13	Timberline	36	7.5	9.2		3
Deadman Hill*(a)Est	35 NS	9.5 NS	NS			East Fork Westcliffe	NS	NS	NS		
McIntyre	55	17.0	19.3	13.6	19	Bourbon	NS	NS	NS		
Brooklyn Lake Fox Park	30	6.5	5.8	5.5	20	Bourbon	1.0	1.0	110		
Pole Mtn.*	24	5.6	4.8	3.1	20	c	OLORADO RI	VER D	RAINAGE	C.	
Libby Lodge	34	8.8	9.2	6.2	19						
Tairpin Turn	34	9.6	9.9	7.1	19	COLORADO RIVEI	R (Above Gler	wood S	Springs)		
Albany	43	10.9	12.0	11.1	8	Cameron Pass*(a)		12.8	18.0	12.5	18
v						Phantom Valley	34	7.3	9.0	6.2	20
POUDRE RIVER						Hoosier Pass*	41	11.0	9.6	6.6	18
Cameron Pass (a) Es		12.8	18.0	12.5	18	Berthoud Pass	44	9.7	12.6	9.2	20
Chambers Lake	31	8.2	7.8	5.0	18	Tennessee Pass	43	8.4	9.6	5.6	20
Big South	11	2.5	2.3	1.7	18	M. Fork Camp Gr		7.5 NS	8.5 NS	6.3	20
Deadman Hill (a) Es		9.5	14.0	7.3	13	Fiddler Gulch	NS NS	NS NS	NS NS		
Lake Irene*	50	13.4 NS	20.5	13.4	18	Lulu Willow Crook B	44	10.0	10.0	7.6	17
Hour Glass Lake	NS 26	6.7	5.8	6.7	8	Willow Creek P. N. Inlet Grand L.	NS	NS	8.1	5.8	18
Red Feather Lost Lake	40	10.7	11.6		6	Lake Irene	50	13.4	20.5	13.4	18
LOSI Lake	40	10. 1	11.0			Arrow	43	9.7	9.5	5.8	18
BIG THOMPSON RIV	ER					Lapland	NS	NS	NS		
ake Irene*		13.4	20.5	13.4	18	Fremont Pass	50	11.6	14.6	9.6	21
idden Valley	30	6.3	9.3	7.8	16	Lynx Pass	NS	NS	NS		
eer Ridge	19	3.3	5.1	5.3	8	Shrine Pass	55	13.1	16.8	10.5	15
ongs Peak	34	8.8	11.1		6	Grizzly Peak	48	11.3	17.7	11.3	15
wo-Mile	37	9.3	13.5		4	Glen-Mar Ranch	35	6.6	7.5	7. 1	9
						Monarch Lake	NS	NS	NS		
T. VRAIN RIVER						Granby	32	6.8	7.9	5.7	8 8
/ild Basin	36	8.7	10.7	8.6	19	Grand Lake	34	6.3	9.0 15.6	7.6	8 6
opeland Lake	19	4.5	4.5	5.9	8	Berthoud Summit	54 36	13.9 7.6	11.3		6
ard	22	4.9	5.3	4.6	7	Frazer View Gore Pass	42	9.7	8.8		5
OULDER CREEK						Frisco	34	6.9	7.8		6
niversity Camp	53	15.0	15.2	11.5	18	Snake River	34	7.1	7.8		6
Infrat	26	7.5	8.0	9.1	7	Summit Ranch	NS	NS	NS		
oulder Falls	34	7.3	NS		4	Vail Pass	60	14.7	19.2		3
	0.1	., 0				Pando	35	9.7	8.7		3
						Kokomo	41	8.9	12.3		3
On adjacent drains	age					Milner	38	8.5	NS		
* Courses with less	than 15 ye	ars re	cord in pe	riod	1938-52	Blue River	34	7.5	NS		
have all years pr	ior to 1953	averag	ged.			Jones Pass	45	11.9	NS		
S No Survey						Ranch Creek	35	8.2	NS		
a) Air observed						Vasquez Creek	39	8.8	NS		

## SNOW COURSE MEASUREMENTS

February 1, 1957

SNOW COURSE	Snew Deptl 1957		nches	ıı	Years of	SNOW COURSE	Snow Depth 1957		er Con Inches		Years of
5110W 60 6115E	In Inches	1957	1956	Avg.	Record		In Inches		1956		Recor
C	OLORADO I	RIVER I	DRAINA	GE	**	COL	ORADO RIV	ER DR	AINAC	3E	**
DOADING FORK						DOLODES BINED					
ROARING FORK Ind. Pass Tunnel	56	14.9	12.9	10.4	21	DOLORES RIVER	39	8.9	8.4	6.4	17
North Lost Trail(a		18.2	10.6	7.5	15	Telluride	31	5.2		5.2	18
Nast	NS	NS	NS			Lizard Head	NS	NS			
Ivanhoe	58	12.9	17.0	11.4	11	Trout Lake	51		11.5		8
Lift			NS		0				11.0	11.0	Ü
						SAN RAFAEL RIVE					
YAMPA RIVER	70	10.0	10.0			Hntngtn-Horseshoe	57		18.5		6
Ory Lake (a)	70 : 70	18.2	18.3	11.9	16	Seeley Creek R.S.	NS	NS	NS		
Columbine Lodge* Elk River(a)	62	18. 1 16. 1	21.1	14.3 9.6	21 17	VIRGIN RIVER					
Lynx Pass*	NS	NS	NS		-	Long Valley Juct.	20	4 2	1.0		_
Routt Line	89	25.0	26.3		6	Harris Flat R.S.	32	4.3 6.9	$\frac{1.0}{2.7}$	6.6 7.2	5 11
Rabbit Ears	87	25.1	26.5		6	Duck Creek R. S.	47		11.4		13
Yampa View	53	13.2	12.0		6	Cedar Breaks	NS	NS	NS	10.2	13
Flat Top	NS	NS				Webster Flats	48	10.0			5
Bear River	NS	NS						10.0	11.0	22.2	J
Clark(a)	54	14.5	17.1			COLORADO R. (S. E.	UTAH				
Old Battle	87	26.6	25.0	19.2	19	LaSal Mt.	NS	NS	NS		
						Buckboard Flat	NS	NS	NS		
VHITE RIVER											
Burro Mountain (a	51	13.3	12.0	10.4	21	PRICE RIVER					
Rio Blanco	59	16.3	14.2	4.3	17	Indian Canyon*	33	6.6	11.0	7.1	21
						Gooseberry Res.	50	13.2	16.8	18.2	6
LATEAU CREEK						Staley Ranch	27	6.4	5.2	6.0	15
Mesa Lakes	59	14.8	12.2	9.2	20	Dry Valley Divide	33	8.0	10.3	7.5	15
Trickle Divide (a)	79	22.1	19.5	15.4	12	Hntngtn-Horseshoe	NS	NS	18.5	25.4	6
**********						Mud Creek	46	12.8	15.1	15.4	7
UNNISON RIVER	c.F	14.0	10 5	0.5	0.1	DUGUESNE DIVER					
rested Butte Park Cone	65 59	14.9	12.7	8.5	21	DUCHESNE RIVER Lake Fork Mt.	0.4				
lexander Lake(a)	63	12.8 16/5	9.1 14.6	6.0 13.2	21 20	Paradise Park	31		13.5		6
ronton Park	44	11.7	11.8	7.3	20	Mosby Mt. (L)	33 27		14.8 11.3	4.9	4
rickle Divide(a)	79	22.1	19.5	15.9	13	Brown Duck Lake	NS	NS	NS	4.1	4
ark Reservoir(a)	75	21.0	18.0	14.3	13	Indian Canyon	33		11.0	7. 1	21
orphyry Creek	63	17.2	11.2	9.6	17		00	0.0	11.0	'. 1	21
Cannah Cr.	NS	NS	NS			UPPER GREEN RIVE	ER (UTAH)				
ake City	NS	NS	NS			Hewinta R.S.	NS	NS	NS		
pring Cr. Pass*	50	11.5	7.1			Hole-in-Rock	NS	NS	NS		
Cochetopa Pass*	27	4.9	5.0	3.7	8 _	King's Cabin (U)	NS	NS	NS		
McClure Pass(a)	69	19.8	17.3		3	King's Cabin (L)	NS	NS	NS		
Red Mt. Pass	NS	NS	NS								
Blue Mesa	NS	NS				GREEN RIVER (WYC	MING				
						Dutch Joe	32	7.7	8.3		
AN JUAN RIVER						Mulligan Park	31	7.4	10.8		1
Volf Creek Pass*	127	33,2	25.2	17.6	17	Kendall R.S.	26	6.3	9.9		1
	133	34.4	25.8	20.0	17	Loomis Park	42		18.9		1
ranite Peaks	46	9.4	7.3	5.6	15	Snyder Basin R.S.	40		15.4		1
a Plata	NS	NS	NS			Piney-LaBarge	49	11.9			
Volf Creek Summi	t 125	31.4	22.2	4.4	6				-1.2		
hama Divide*	23	5.1	5.0	4.4	17	GILA RIVER					
Chamita*	47	12.3	9.0	7.0	15	Frisco Divide	8	2.0	2.5	2.1	19
						State Line	10	2.5	2.1	2.9	19
NIMAS RIVER						Taylor Creek	T	T	0.5	0.7	15
						Inman	T	T	0.5	0.8	11
conton Park*	44	11.7	11.8	7.3	20	Nutrioso	T	1.0	2.5	2.5	19
ascade	62	14.9	13.4	8.2	18	Beaver Head	8	1.1	1.5	3.2	19
pud Mt.	94	23.8	23.1		6	Coronado Trail	5	0.9	2.3	3.7	19
Iolas Lake Iowardville	57 NS	15.5	12.2		6	Rose Canyon	12	4.8	1.1	0.8	9
COWSTOVILLA		NS	10.9		6	Bear Wallow	13	4.8	2.6	2.4	9
	NS	NG									
Iineral Creek	NS NS	NS NS	NS NS								

On adjacent drainage
 \*\* Courses with less than 15 years record in period 1938-52 have all years prior to 1953 averaged.

NS No Survey
(a) Air observed

## SNOW COURSE MEASUREMENTS

February 1, 1957

SNOW COURSE	Snow Depth 1957		r Cor		Years		Snow Dept				Years
SNOW COURSE	In Inches			Avg.	of Record	SNOW COURSE	1957 In Inches		n Inch 1 <b>9</b> 56	e <b>s</b> 6 Avg.	of Record
CO	LORADO RIV	ות מש	ATNIA	CF	**		O GRANDE	T DB 4	INIACE		**
CO	LORADO KIV	ER DI	, WIII W	GE				DRA	INAGE	•	
SALT RIVER						RIO GRANDE IN CO					
Forest Dale	13	2.6	2.1	1.3	17	Pyramid	NS	NS	NS		
McNary	16	2.8	3, 2	3. 1	18	Spring Creek	50	11.5	7.1		4
Nutrioso	7.	1.0	2.5	2.5	19	Pool Table	NS	NS	NS		
Coronado Trail	5	0.9	2.3	3.7	19	L. Humphreys Cochetopa Pass	NS	NS	NŞ		
Milk Ranch Workman Creek	14 18	2.8	3.5	1.9	16 5	Red Mt.	27 NS	4.9 NS	5.0 NS		8
Maverick Fork	NS	3.0 NS	2.4 NS	7.9	ა 7	Porcupine	NS 57	14.2	8.4		4
Baldy	23	5.0	NS	6.4	7	Wolf Creek Summit	125		22.2		6
Fort Apache	NS	NS	NS	6.3	7	Hiway	NS		21.3		1
Pacheta	14	3.0	2.9	3.7	7.	Pass Creek	70		11.1		1
						ALAMOSA RIVER	•				
VERDE RIVER						Silver Lakes	47	9.0	7.3	4.7	17
Iron Springs*	17	5.1	0.0	1.4	11	Summitville (a)	70	16.5		11.3	12
Camp Wood	19	3.5	0.0	1.4	11	(a)	10	10.5	0.5	11.5	12
Mingus Mountain	17	2.9	Т	1.9	10	CONEJOS RIVER					
Mormon Lake*	NS	NS	1, 1	6.6	10	River Springs	47	10.3	6.0	6.0	16
Fort Valley*	19	2.7	1.5	3.7	10	Cumbres Pass (a)	76		17.9	13.7	18
Chalender	NS	NS	0.5	4.1	10	Platoro	NS	NS	NS		==
Munds Park	NS	NS	T	2.7	7	West Conejos	NS	NS	NS		
Casner Park	NS	NS	0.8	4.9	7	La Manga (a)	92	23.0	21.6		6
Mormon Mt.	NS	NS	2.7	6.0	7						
Happy Jack	NS	NS	NS	4.3	6	SANGRE DE CRISTO		COLOR	RADO)		
						LaVeta Pass	48	12.4	8.5	5.6	17
LITTLE COLOR AL						Culebra	44	8.7	6.8	6.9	17
Forest Dale	13	2.6	2.1	1, 3	17						
McNary	16	2.8	3.2	3.1	18	CHAMA RIVER					
Nutrioso	7	1.0	2.5	2.5	19	Cumbres Pass	76	20.6		13.7	18
Mormon Lake	NS	NS	1.1	6.6	10 10	Payrole (a)	43 23	11.2	5.0	7.1 4.4	16 17
Fort Valley	19	2.7	1.5 2.7	3.7 6.0	7	Chama Divide Chamita	47	12.3	5.0 9.0	7.0	15
rmon Mt.	NS NS	NS NS	NS	4.5	6	Bateman	46	11.0	8.1	8.5	7
opy Jack	NS NS	NS	1.9	3.8	7	Dateman	40	11.0	0.1	0, 0	•
Heber	NS	NS	1.8	4.1	7	PECOS RIVER					
Canyon Creek	NS	NS	1.7	4.6	7	Panchuela	10	1.7	1.6	3.1	18
ounjon oroun	110	110		1.0		Big Tesuque	17	4.5	2.8	4.4	15
WILLIAMS RIVER						Rio En Medio*	24	6.5	4.6	3.7	7
Iron Springs	17	5.1	0.0	1.4	11						
Camp Wood*	19	3.5	0.0	1.4	11	RIO GRANDE IN NEW	MEXICO				
Willow Ranch	NS	NS	0.0	1.2	11	Red River	36	10.5	5.5	5.5	17
						Taos Canyon	24	6.3	3.7	4.7	17
LOWER COLORAD	O RIVER					Aspen Grove	14	3.5	3.5	3.8	18
Bright Angel	52	11.8	6.6	9.2	9	Hematite Park*	24	4.2	1.6	3.7	16
Grand Canyon	19	3.1	1.7	3.3	9	Tres Ritos	24	4.8	3.4	4.5	18
Fort Valley	19	2.7	1.5	3.7	10	Payrole (a)	43	11.2	5.0	7.1	16
Chalender*	NS	NS	0.5	4.1	10	Cordova (a)	49	11.0	5.5	7.1	15
						Big Tesuque	17	4.5	2.8	4.4	15
R	IO GRANDE D	RAIN	AGE			Elk Cabin	7	2.6	3.2	2.5	9
RIO GRANDE IN CO	OT OR A DO					Rio En Medio	24 NC	6.5	4.6	3.7	7
		22 9	25 9	17 6	15	Quemazon	NS	NS	NS		
Wolf Creek Pass Upper Rio Grande	127 41	33.2		17.6	17	Fenton Hill			4.2		5
Santa Maria	41	7.3	6.0 4.7	5.3 3.8	17 18	CANADIAN RIVER					
Ft. Garland	17	3,3	1.0	2.0	16	Hematite Park	24	4.2	1.6	3.7	16
rt, Garrand	11	3, 3	1.0	2.0	10	Tres Ritos	24	4. 4	3.4	4.5	18
* On adjacent drai	inage					Cordova (a)	49	11.0	5.5	7.1	15
** Courses with les		rs rec	ord i	neriod	1938-52	(a)	10	-1.0	0.0		10
have all washes n				. perrou	1000 02						

have all years prior to 1953 averaged.

NS No Survey

(a) Air observed

## STATUS OF RESERVOIR STORAGE

February 1, 1957

CAPACI 1000 A. I			15-yr, Avg.	RESERVOIR	CAPACITY			15-yr. Avg.
1000 A.J	F 1057		TO JI. AVE.	WESTWAOTW	OMI MOIL			10-yr. Avg.
	. 1001	1956	1938-52		1000 A.F.	1957	1956 .	1938-52
TH PLAT	TE DRAD	NAGE			ARKANSAS DI	RAINA	GE	
1900.0	565.0	824.5	1087.7*	Twin Lakes	57.9	8.2	15.8	24.7
70.0				Sugar Loaf	17.4	5.0	7.1	7.8
58.8				Clear Creek	11.4	5.4	4.3	5.5
166.0				Meredith	41.9	0.0	0.0	15.0
970.0	285.7			Horse Creek	26.9	0.0	0.0	7.9
44.3	36.7	28.1	34.4	Adobe Creek	61.6	0.0	0.0	24.2
140.5	234.9	353.6	348.9	Cucharas	40.0	0.7	12.1	5.9
98.9			28.5	John Martin	655.0	1.7	52.0	59.4*
H PLAT	TE DRAIN	AGE		Great Plains	150.0	0.0	0.0	44.2
17. Ö	0.8	2, 3	8.2	Model	15.0	0.0	1.9	3. 1
9.5	4.3	4.0	5.5	Conchas(NM)	600.0	156.3	265.3	260.5*
11.6					COLORADO DI	RAINA	Æ	
8, 2				Taylor Park	106.2	19.7	34.8	60.1
6.4				Vallecito	126.3	19, 1	42.0	40.8*
8.8	1.0	1.0	2.4	Groundhog	21.7	1.5	3.5	7.8*
34.3	0. 0	0. 0	4.6	Granby	467.5	164.3	153.3	*
8.0				Green Mountain	146.3	67.2	77.6	73.0*
143.5		-	*	Lake Mead	27, 207. 0 11			19,438.0
14.3			4 6	Lake Havasu	688.0			554.6
			•	Lake Mohave	1,810,3 1			1,045,2
9.2				RIO G				-,
5.4				Rio Grande	45.8	3.8	4.0	14. 1
112.4			*	Santa Maria	45.0		2.4	8.9
12.7			6.8	Sanchez	103.2			12. 3
81.9				Terrace	17.7			2.8
79.0				Continental	26.7	2.4	-	6.9
18.9				Platoro	60.0	1. 0	0.0	*
33.0				RIO-C	RANDE (N. M.	) DRA	INAGE	
32.2	10.5							892.6
				Caballo	365.0			173.3
18.5				El Vado	226.0	-	-	58.8
10.3				Alamogordo	128.0			63.3
20.6					37.0			14.7
-		-						
37.7				Roosevelt	1,382,0	123.5	216.0	422.3
35.4	24.8		27.2	Horse Mesa	245.1	80.9	243.3	179.5
32.8				Mormon Flat	58.0			29.3
70.0					70.0	47.9	66.8	19.2
28.2				Bartlett	180.0		75.6	48.7
	10.0	-0.0	20.0	Horseshoe	143.0	-		15.5
				Carl Pleasant	163, 8			21.1
				San Carlos	1.205.0			167. 1
	58.8 166.0 970.0 44.3 140.5 98.9 TH PLAT 17.0 9.5 11.6 8.2 6.4 8.8 34.3 8.8 34.3 14.3 44.0 9.2 5.4 112.4 12.7 81.9 33.0 32.2 4.4 18.5 10.3 20.6 57.5 37.7 35.4 37.7	50.8 7.0 166.0 171.7 970.0 285.7 44.3 36.7 140.5 234.9 98.9 1H PLATTE DRAIN 17.0 0.8 9.5 4.3 11.6 2.0 8.2 4.1 6.4 2.1 8.8 1.0 34.3 0.0 8.0 3.3 143.5 69.6 14.3 8.3 44.0 4.7 9.2 1.2 5.4 3.7 112.4 53.6 12.7 2.3 81.9 23.7 79.0 22.4 18.9 15.5 33.0 0 32.2 10.5 24.4 0.0 18.5 4.4 10.3 0.1 20.6 1.2 57.5 21.2 37.7 10.0 35.4 24.8 32.8 0.0 77.0 20.6	58.8 7.0 21.0 166.0 171.7 170.0 970.0 285.7 331.0 44.3 36.7 28.1 140.5 234.9 353.6 98.9	58.8 7.0 21.0 23.4 166.0 171.7 170.0 82.3* 970.0 285.7 331.0 381.3* 44.3 36.7 28.1 34.4 140.5 234.9 353.6 348.9 98.9	Clear Creek   Meredith   Horse Mesa   Mobel Creek   Cucharas   John Martin   Great Plains   Model   Cucharas   John Martin   Great Plains   Model   Conchas(NM)   Model   Conchas(NM)    Taylor Park   Vallecito   Granby   Green Mountain   Lake Mead   Lake Havasu   Lake Mead   Lake Havasu   Lake Mead   Lake Havasu   Lake Mohave   RIO G   Rio Grande   Santa Maria   Sanchez   Terrace   Continental   Sanchez   Terrace   Continental   Sanchez   Terrace   Continental   Platoro   RIO G   Elephant Butte   Caballo   Elephant Butte   Caballo   McMillan-Avalor   Sanchez   Sala   Sal	S8.8	See   1.0	Taylor Park   106.2   19.7   19.8   19.2   19.2   19.2   19.3   19.2   19.2   19.3   19.2   19.2   19.3   19.2   19.3

## VALLEY PRECIPITATION1/

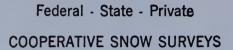
## Division Averages and Departures 3/

		all		inter
DRAINAGE DIVISIONS	Sept	OctNov. Dept.	Dec. Avg.	Dept. 2/
DIVIDIONS	Avg.	Dept.	Avg.	Dept.=
North Platte River, Wyo.	2.16	-1,72	. 87	<i>∤</i> . 18
South Platte River	2.98	-1.39	. 47	09
Arkansas River	3.52	-2.42	. 64	10
Colorado River	3.18	-2.81	1, 16	-, 23
Green River, Wyo.	1.55	-1.43	. 65	f. 11
San Juan River, N.M.				, .
Colorado River, Ariz				
Gila River, Arizona				
Canadian River, N. M				
Rio Grande, Colorado	2.05	2.26	. 25	-, 24
Rio Grande (N), N. M.				
Rio Grande (S), N. M.				
Pecos River, N. M.				

- 1/ Preliminary analysis by U.S. Weather Bureau from data furnished by Meteorological Service & U.S. Weather Bureau
- 2/ Departure from average
- 3/ Selected Stations

## SOIL MOISTURE MEASUREMENTS

STATION	Percent Available Soil Moisture on November 1						
	1956	1955	1954				
NORTH PLATTE							
Columbine Lodge	0	8	51				
Willow Creek	32	51	69				
SOUTH PLATTE							
Red Feather	7	21	16				
Chambers Lake	15	26	62				
Deer Ridge	13	19	31				
Hidden Valley	34	50	92				
Longs Peak	7	17	25				
University Camp	11	13	19				
Berthoud Falls	0	33 ·	49				
ARKANSAS							
Leadville	34	37	20				
UPPER COLORADO							
Vail Pass	6	18	50				
ROARING FORK							
Placita	20	10					
Maroon	8	20	<b>3</b> 5				
RIO GRANDE (Colorado)							
Bristol View	2	4	48				
Wolf Creek Pass	4	30	61				
River Springs	34	5	8				
RIO GRANDE (N. M.)							
Red River	12	60					
Tres Ritos	10	41					
Tres Piedras	6	18	10				



Furnishes the basic data necessary for forecasting water supply for irrigation, domestic and municipal water supply, hydro-electric power generation, navigation, mining and industry

"WATER IS THE WEST'S GREATEST RESOURCE"